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Senior Engineering Technologist
District of Central Saanich, Engineering
Department

From: Christina Ball
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Sidney, British Columbia

Project/File: 111720170

Date: July 20, 2023

Reference: Brentwood Bay Sanitary Sewer Upgrade Project – Bald Eagle Nest

Introduction

The Brentwood Bay Sanitary Sewer Upgrade Project (the Project) includes the installation of a sanitary sewer lines along the Tickner Road road allowance, upgrading of the existing Wallace Drive sanitary sewer line, and upgrading of the Silverdale Road pump station within the municipality of Central Saanich, British Columbia. This work will involve clearing vegetation and machine excavation and backfilling of the sanitary sewer line trench. Construction work is expected to commence in 2023 and continue for approximately one year.

A bald eagle (*Haliaeetus leucocephalus*) nest is located within the Tickner Road road allowance (UTM 10U 5380452.58 northing, 467534.88 easting) approximately 10 m from the sanitary sewer line and 25 m from Wallace Drive (Attachment A). This nest was first identified in 2019 and was used for nesting in 2019, 2021, and 2022 (WiTS 2023). Bald eagles are protected under Section 34 of the provincial *Wildlife Act* which prohibits the injury, molestation, destruction, or possession of a bald eagle individual, egg, or nest. Bald eagle nests are also protected year-round, whether active or not, and a permit from the Province is required if a nest needs to be removed or destroyed. If an activity or development will “molest, injure or destroy” a nest site (i.e., the nest or nest tree), protective buffers may need to be established to reduce disturbance to the nest, although the degree of protection required is not specified by the Act. While the provincial government retains jurisdiction over raptors in British Columbia, the Central Saanich municipal government is responsible for the protection of trees, including nest trees, in Central Saanich, through the Tree Management Bylaw (Bylaw No. 2065).

This memo provides an overview of the Project, summary of the findings of a site visit and consultation with the Ministry of Water, Land and Resource Stewardship (MWLRS), and recommendations to mitigate the effects of the Project on the nest tree and bald eagles.

Project Overview

Sanitary Sewer Lines

The existing sanitary sewer line along Stelly’s Cross Road operates as a siphon system, constructed in 1971 and twinned in 1987. Due to ongoing maintenance issues, condition assessment uncertainties, and scour velocity concerns, it was recommended that the Stelly’s Siphon be converted into a gravity system (Opus 2015). The preferred replacement option is a gravity sanitary sewer line along Tickner Road that will then feed into the upgraded sanitary pump station at Silverdale Place and, ultimately, the sanitary sewer line along Wallace Drive.

Reference: Brentwood Bay Sanitary Sewer Upgrade Project – Bald Eagle Nest

The work to install the gravity sanitary sewer line along the Tickner Road road allowance will involve clearing and grubbing vegetation within the work area, excavating a trench, installing pipe, backfilling, and recontouring and revegetation of the work area. These construction activities are anticipated to take 6-8 weeks and are dependent on the contractor's construction schedule.

The work to upgrade the existing sewer line along the Wallace Drive road allowance will involve excavating a trench, installing pipe, backfilling, and repaving. Vegetation clearing is not required for this section of sewer line installation. These construction activities are anticipated to take several months and are dependent on the contractor's construction schedule.

Pump Station

The Silverdale Pump Station is located on Silverdale Place approximately 195 m from the bald eagle nest (Attachment A). The pump station will be upgraded to be able to handle the increased load in the system following the sanitary sewer line upgrade. The pump station upgrade will entail complete removal of the existing below-ground pump station; temporary bypass pumping of the sewage flows; installation of a new below-ground pump station, including upgraded pumps and mechanical equipment; excavation; backfilling; repaving and sidewalk replacement; and boulevard restoration. These construction activities are anticipated to take six to twelve months, dependent on soil and weather conditions and sanitary flow volume. Noise disturbance from excavation machinery (periodic) and bypass pumping equipment (continuous) is expected to occur throughout the work period.

Site Visit

A site visit was completed on April 25, 2023 by a wildlife biologist to determine if the bald eagle nest was occupied and to evaluate the site in relation to the proposed project activities. A bald eagle was visible sitting in the nest and a second bald eagle was visible perched in the tree above the nest, confirming that the nest is currently active. The nest is approximately 20 m above ground in a large, 2.5 m diameter, balsam poplar (*Populus balsamifera*) tree.¹ The nest tree is in a T-shaped patch of deciduous trees and shrubs, which extends over 100 m east and west along Wallace Drive and approximately 80 m north of the nest tree (Attachment A). West of the nest tree, located outside of the sanitary sewer line, is a 45 m by 30 m pond.² Outside of this shrubby forest habitat the land base is comprised of agricultural and residential development, including a primary road (Wallace Drive). A shopping centre is located approximately 250 m west of the nest tree and Brentwood Bay village is located approximately 400 m west of the nest tree.

A Certified Arborist visited the site on April 28, 2023 and assessed the nest tree and other trees within the Tickner Road road allowance (Attachment B). The bald eagle nest tree was assessed as being in fair structural and health condition and the critical root zone (CRZ) was estimated to be 27.0 m (Attachment B). The CRZ is the radial area from the trunk of the tree within which disturbance to the tree root system should be avoided. The arborist report notes that construction activities, including traffic, storage of materials, grading, and trenching, can result in soil compaction, crushing or severing of roots, injury to aboveground portions of the tree, and changes to drainage (Attachment B).

¹ The arborist report recorded the diameter as 1.8 m, however they also noted that the diameter was larger than the extent of their tape measure (Attachment B).

² The pond is located on privately owned land and was not assessed during the site visit. However, the pond may provide habitat for breeding amphibians which may disperse through the construction area. Mitigation measures for amphibians are not included in this memo.

Reference: Brentwood Bay Sanitary Sewer Upgrade Project – Bald Eagle Nest

Trees may exhibit reduced growth, branch dieback, changes in leaf size or colour, or tree death from large disturbances, and the effects may not become apparent for several years post-disturbance (Attachment B).

Consultation

On May 16, 2023 the District of Central Saanich and Stantec's engineering team (Yvan Sylvestre, Adam Overend, Al Ghanam, and Tomasz Zolyniak) with support from Stantec's qualified wildlife professional (Christina Ball) met with Emily Upham-Hills from MWLRS to discuss the bald eagle nest and the Project. Following the meeting, the arborist report (Attachment B) and a figure showing the location of the nest tree in relation to the Project was provided to Emily Upham-Hills for review. Based on the May 16, 2023 meeting and follow-up correspondence it was confirmed that a *Wildlife Act* permit was not required unless the nest tree needed to be removed. The District of Central Saanich is committed to retaining the nest tree.

Mitigation Recommendations

The intent of mitigation is to manage the potential adverse effects of the project activities on the bald eagle nest whether it is active or not. The mitigation recommendations encompass measures to protect the structure and health of the tree ('nest tree protection') and to reduce sensory disturbance to the bald eagles (adults and young) using the nest during the active period.

Nest Tree Protection

Mitigation is recommended to maintain the structural integrity of the nest tree during construction. Construction activities such as trenching and vegetation clearing, and soil compaction from project equipment has the potential to adversely effect the structure or health of the nest tree through damage to the trunk or root system.

The following mitigation measures are recommended to reduce the risk of damage to the nest tree related to project activities:

- Best management practices for bald eagle nests in rural areas recommend a year-round 100 m buffer around the nest tree (Attachment A) to maintain habitat (BC MFLNRO 2013). Within the 100 m habitat protection buffer (BC MFLNRO 2013) the width of the construction footprint should be reduced to the extent practical. Vegetation outside of the construction footprint but within the 100 m habitat protection buffer should be retained (Attachment A).
- Based on the recommendations of the Certified Arborist, clearing and construction activities should be avoided within the CRZ, a 27.0 m buffer around the tree to protect the integrity of the tree root system (Attachment A). The sanitary sewer line will be located within the road allowance as far from the nest tree as is technically feasible and the construction footprint will be reduced to the extent practical within the CRZ.
- A Tree Protection Zone will be clearly marked around the nest tree and other trees intended to be preserved, using stakes or temporary construction fencing (Attachment B).

Reference: Brentwood Bay Sanitary Sewer Upgrade Project – Bald Eagle Nest

- Construction activities are expected to extend into the CRZ, which may damage the root system and undermine the health of the nest tree (Attachment B). To mitigate effects on the tree, construction will follow the recommendations for tree protection during construction described in the arborist report (Attachment B). This includes following the Tree Preservation Guidelines, having a Certified Arborist present to oversee preliminary excavation, and having a Certified Arborist present to air spade around roots to allow final root cuts to be made by chainsaw (Attachment B).
- Following completion of construction, the 100 m habitat protection buffer will be revegetated using native shrub and tree species. Bald eagles require large trees, typically Douglas-fir (*Pseudotsuga menziesii*), balsam poplar, or black cottonwood trees (*Populus trichocarpa*), for nesting. Suitable trees large enough to support bald eagle nest structures are a decreasing resource in developed areas on Vancouver Island (BC MFLNRO 2013). Consider planting Douglas-fir, balsam poplar, or black cottonwood trees within the road allowance or other nearby suitable areas to provide future nest trees.
- Following completion of construction, annual monitoring of the nest tree and other retained trees by a Certified Arborist is recommended to assess ongoing tree health (Attachment B).

Sensory Disturbance

Mitigation is also recommended to reduce the potential effects of project-related sensory disturbance (e.g., noise and vibration) on bald eagles during the active period. The active period for bald eagle nests in the West Coast region is approximately January 5 to August 31 or until young have left the nest area (BC MFLNRO 2013). During this period if adults are using the nest or young are present at the nest, the nest is considered active.

Sensory disturbance from construction activities such as tree felling and vegetation removal, excavation, pipe installation, and paving has the potential to adversely effect bald eagles. For example, sensory disturbance has the potential to result in nest abandonment, particularly during the courtship and egg-laying phases (USFWS 2023).

The following mitigation measures are recommended to reduce potential effects from sensory disturbance:

- Best management practices for bald eagle nests in rural areas recommend a 200 m 'quiet zone' buffer around the nest tree when the nest is active to reduce disturbance to the adults and young (BC MFLNRO 2013) (Attachment A).
- Vegetation clearing and construction activities related to the Wallace Drive and Tickner Road sanitary sewer line installation will be avoided within the 200 m quiet zone buffer (see Attachment A during the active period).
- The Silverdale Pump Station is within the 200 m quiet zone buffer (see Attachment A). Work to upgrade the pump station is expected to overlap the nesting period. As recommended by MWLRS, if excavation, backfilling, or paving work at the pump station occurs during the active season a Qualified Registered Professional (QRP) will monitor the nest, as follows:
 - Monitoring will begin at least two days prior to the activities to determine baseline activity patterns.
 - Monitoring will focus on the nest and the adult bald eagles, but will also consider the behaviour of the hatchlings and fledgelings.

Reference: Brentwood Bay Sanitary Sewer Upgrade Project – Bald Eagle Nest

- The QRP will assess the behavioural responses of the bald eagles and use their professional judgement to determine if a 'stop work' is required.
- A 'stop work' will be issued for a period of at least 4 hours after the QRP observes agitation or a marked change in the adult bald eagle's behaviour.
- If a 'stop work' is issued on three consecutive days an additional two day 'stop work' will be initiated.
- After the Project is completed, follow-up monitoring of the nest by a QRP is recommended to determine ongoing nest use. This monitoring is recommended to occur once annually for five years starting in the first spring following completion of construction. Results of this monitoring will be provided annually to the Wildlife Tree Stewardship Atlas (WITS 2023).

Closure

If there are questions or concerns, please contact the undersigned directly.

Regards,

STANTEC CONSULTING LTD.

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Wildlife Biologist
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Attachments: Attachment A: Location of Bald Eagle Nest Tree within Tickner Road Allowance
Attachment B: Arborist Report

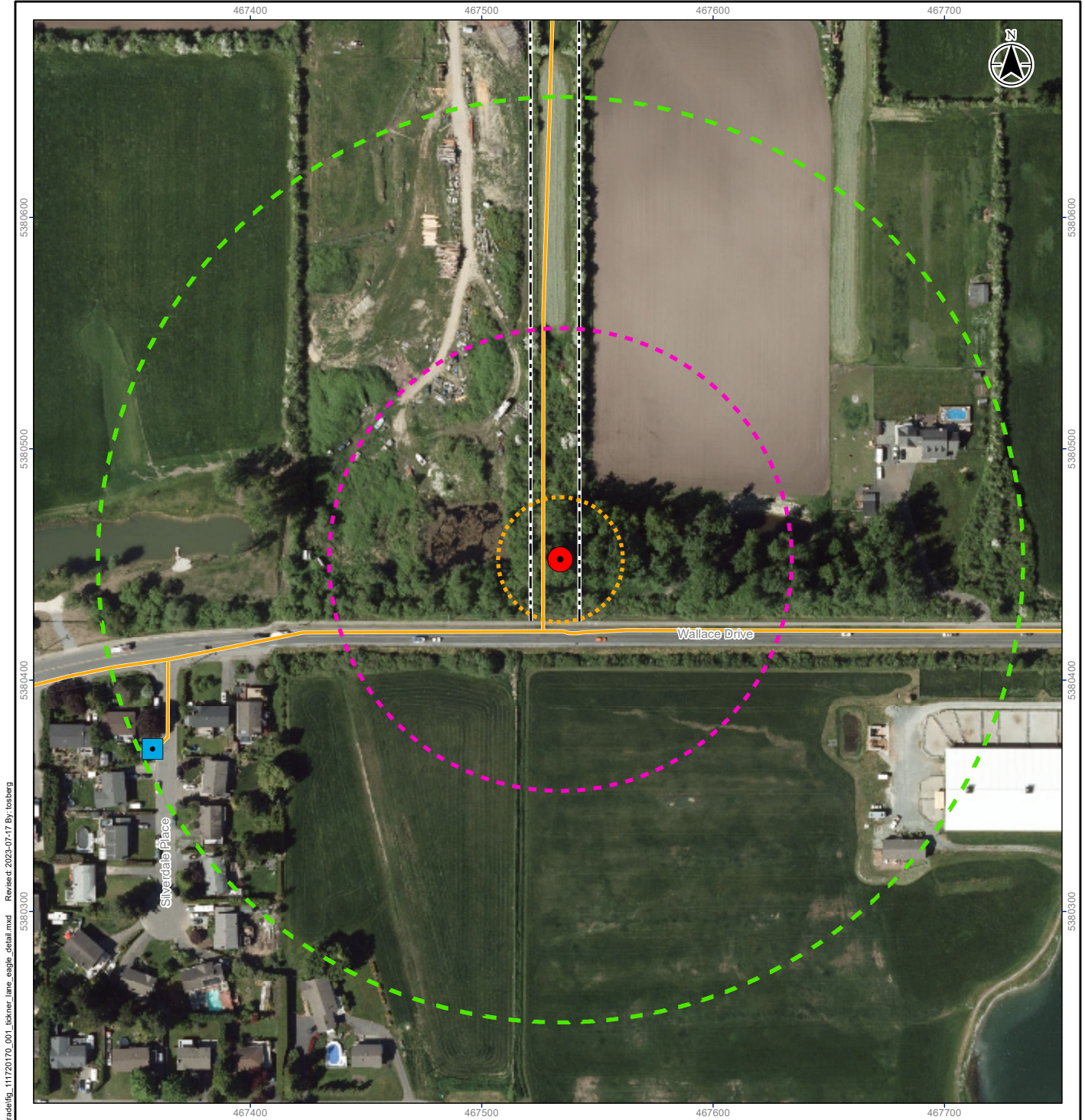
Reference: Brentwood Bay Sanitary Sewer Upgrade Project – Bald Eagle Nest

References

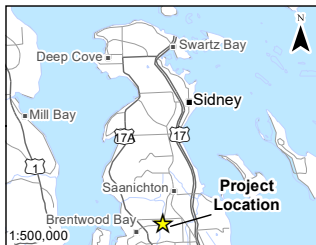
- BC MFLNRO (British Columbia Ministry of Forests, Lands and Natural Resource Operations). 2013. Guidelines for Raptor Conservation during Urban and Rural Land Development in British Columbia. A Companion Document to Develop with Care 2012.
- Opus (Opus DaytonKnight Consultants Ltd.). 2015. District of Central Saanich Sanitary Sewer Master Plan. Prepared for District of Central Saanich.
- USFWS (United States Fish and Wildlife Service). 2023. Bald Eagle Nesting & Sensitivity to Human Activity. Available at: <https://www.fws.gov/Alaska-eagle-nesting>. Accessed: June 2023.
- WITS (Wildlife Tree Stewardship Atlas). 2023. Wildlife Tree Stewardship Atlas On-line Map Tool. Available at: https://cmnmaps.ca/WITS_gomap/. Accessed: May 2023.

Reference: Brentwood Bay Sanitary Sewer Upgrade Project – Bald Eagle Nest

Attachment A Location of Bald Eagle Nest Tree within Tickner Road Allowance

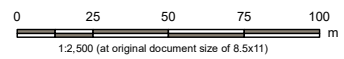


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Notes
 1. Coordinate System: NAD 1983 UTM Zone 10N
 2. Data Sources: District of Central Saanich; DataBC, Government of British Columbia; Natural Resources Canada.
 3. Imagery: Capital Regional District 2021.

- Eagle Nest
 - Silverdale Pump Station
 - Tickner Road road allowance
 - sanitary sewer line
- Protection Zone**
- Critical Root Zone (27 m)
 - Habitat Protection (100 m)
 - Quiet Zone (200 m)



Project Location: District of Central Saanich, Tickner Road
 Project Number: 11721070
 Prepared by: TOSBERG on 20230705
 Request by: CBALL on 20230704
 Checked by: VVORTHINGTON on 20230705

Client/Project/Report: District of Central Saanich, Brentwood Bay, Sanitary Sewer Upgrade

Figure No. **1**
 Title: **Location of Bald Eagle Nest Tree within Tickner Road Allowance**

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Reference: Brentwood Bay Sanitary Sewer Upgrade Project – Bald Eagle Nest

Attachment B Arborist Report



Wallace Drive Sanitation Tree Protection Plan

PREPARED FOR:

Stantec Consulting
400 – 655 Tyee Road
Victoria, BC V9A 6X5
Attention: Tom Zolyniak

PREPARED BY:

Peter McAra
Field Consulting Arborist
ISA Certified Arborist #PN-7521A
ISA Tree Risk Assessment Qualified

PROVIDED BY:

Nathan Franklyn
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ISA Tree Risk Assessment Qualified



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Tree Protection Plan Report

Wallace Drive
Victoria, BC V9B 3A6
May 2, 2023

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Background

Tom Zolyniak (Stantec Consulting) retained Bartlett Tree Experts (BTE or Bartlett) to provide a preservation plan for the proposed project through the Thickner Road Easement. Stantec Consulting is overseeing the project planning and preparing it for tender on behalf of the District of Central Saanich. The project involves the installation of a sanitary line from Stelly's Cross-Road to Wallace Drive through the easement referred to as Thickner road.

The District of Central Saanich (DCS) requires a Tree Preservation Plan for the site, based on the plans involved and the trees proximity to the proposed scope of work. Field Consulting Arborist Peter McAra was tasked with this assignment.

Purpose

The intended purpose of this report is to provide information on the condition of the trees on site, provide recommendations in regards to the proposed scope of work and ensure that adequate measures are executed to ensure that the trees CRZ is protected during the construction.

Limits of the Assignment

Information regarding the trees included in this report was obtained from:

- the physical inventory conducted by BTE.
- emailed plans from Mr. Tom Zolyniak:
 - C119.pdf

An inventory of the trees on and off the property was completed to assess how they may be impacted by the proposed development. A visual inspection was performed of these trees and a numbering system was assigned. Individual trees/ and or tree groupings were affixed with a blue aluminum tag for identification purposes.

Data collected in the field included species, diameter at breast height (DBH measured at 1.4m), approximate height, and the overall tree condition. The critical root zone radius (CRZ) was determined using the *Best Management Practices* and the Tree Protection Distance Table in Appendix IV.

The weather conditions were clear skies and warm temperatures at the time of the assessment. This tree inventory was not a tree risk assessment. As such, no trees were assessed for risk in accordance with industry standards, nor are there any tree risk ratings or risk mitigation recommendations provided within this preservation plan.

All recommendations made in this report are based on our interpretation of the plans provided and our email communication with the client.

A review of the project and the management recommendations of the trees may need to be modified if the scope of work and/or project details are revised.

Care has been taken to obtain all information from reliable sources. All data has been verified insofar as possible; however, the consultant can neither guarantee nor be responsible for the accuracy of information provided by others.



Photo 1. View of the subject trees from the sidewalk at the north side of Wallace Drive (04/28/2023)

Illustrations, diagrams, graphs, and photographs in this report, being intended as visual aids, are not necessarily to scale and should not be construed as engineering or architectural reports or surveys.

Information contained in this report covers only those items that were examined and reflects the condition of those items at the time of inspection. There is no warranty or guarantee, expressed or implied, that problems or deficiencies of the plans of the property in question may not arise in the future.

Methods

The inventory of trees was conducted on April 28, 2023. The assessment included all trees 10cm and greater in diameter on the site. The following list of criteria was included within our inventory:

1. Identifying the species of tree;
2. Measuring the trunk diameter at 1.4 m above grade;
3. Evaluating the health and structural condition, and assigning an overall condition of Good, Fair, Poor or Dead, based on the following criteria:

Good A healthy tree that may have a slight decline in vigor, small amount of twig dieback, minor structural defects that could be corrected;

- Fair** Tree with moderate vigor, moderate twig and small branch dieback, thinning of crown, poor leaf color, moderate structural defects that might be mitigated with regular care;
- Poor** Tree in decline, epicormic growth, extensive dieback of medium to large branches, significant structural defects that cannot be abated;
- Dead**

Effects of construction on trees

Tree root systems are generally confined to the uppermost 1m of the soil profile. Construction activities can cause profound changes to the area surrounding a tree's root system. Access traffic, storage of materials, grading, and trenching can result in soil compaction, crushing or severing of roots, injury to aboveground portions (trunk and branches), and drainage changes.

Cutting of roots reduces a tree's ability to supply itself with water and nutrients necessary to produce the sugars and carbohydrates necessary for sustaining life. Compaction of the soil reduces air pockets in the soil and makes it more difficult for roots to grow through it. It also slows or even prevents drainage of irrigation or storm water, which can result in excessively wet conditions, leading to root rot. Breakage and injury to a tree's trunk and branches reduce its aesthetic value, but more importantly, can leave entry points for pests and diseases.

The issues above often do not appear immediately after the area surrounding a tree has been disturbed. It can be years after the project has been completed that stress signs become apparent. Reduced growth, changes in color or leaf size, branch dieback, or even tree death can follow large disturbances.

Tree Impacts

The proposed project will require the removal of the following trees:

- Three Balsam poplar (*Populus balsamifera*) #523, #526, #527
- Two crabapple (*Malus fusca*) #524 and #528
- One Babylon willow (*Salix babylonica*) #525

Other smaller understory trees and shrubs, not included within the inventory due to the diameters being less than 10cm, shall be removed as well. It is recommended that these trees be cut down with a chainsaw and not pulled with a machine when in proximity to any retained trees CRZ.

The large multi-stemmed Balsam poplar #530 tree has an active Bald Eagle nest in the upper canopy. As such, all work must be planned around the retention of this tree and timed when the nest is no longer active. The over-mature tree has an estimated 180cm DBH, the stem was larger than my diametric tape could measure. The trees canopy radius is widespread (~15m) and the work is likely to infringe upon the trees CRZ due to the limit area. The species of tree have a moderate – good construction tolerance. To my understanding the trench required for the sanitary line installation will be approximately 1m wide and at least 1m below grade. The further the trench is to the west of this tree, the less likely it is to encounter any significant structural roots from the tree.

Balsam poplar tree #529 is in poor structural condition. The estimated 112 cm DBH tree CRZ will not be entirely protected as the proposed trench excavation is approximately 5m from its base. Ideally, this tree could be retained to act as a wind dampening buffer for tree #530. However, it has large deadwood in the upper canopy and an overextended limb over the proposed work zone on the west side of its canopy. A retrenchment prune to remove the large deadwood and reduction of the overextended canopy is recommended prior to the work.

Due to the tree having a large cavity at the base and proximity to the work zone. I have the trees retention status as yet to be determined. This is to be determined by the Project Arborist during a preliminary excavation through the proposed trench placement within the trees CRZ. Due to the likelihood of the tree having many large structural roots within the proposed work area, the Project Arborist must oversee a preliminary excavation. The excavation is to take place outside of the Tree Protection Zone (TPZ) which must first be installed prior to any work. What makes the most economical sense is when the stump of tree #527 is ground out with the use of a stump grinder, the machine is also used to excavate the trench within the CRZ of #529. The Project Arborist could be on hand with an airspade to blow compressed air around any roots at the east side of the trench to make any final cuts with a chainsaw to enable the best chance of the wound compartmentalizing. Based on the amount of large structural roots encountered from the tree the determination of the trees retention will be made at this time. Once the roots have been pruned after the preliminary excavation, the use of a mini excavator to dig the trench for the sanitary line excavation can take place.

The mature balsam poplar #531 will also be retained and have tree protection fencing installed to protect as much of the trees CRZ as possible. Similar to the tree above the Project Arborist will oversee a preliminary excavation is to identify any significant roots outside the trees fencing. Roots encountered will be pruned to minimize the size of the wound to ensure their best chances of compartmentalization.

To protect the retained trees from construction impacts, I recommend following the Tree Preservation Guidelines provided in this report.

Tree Preservation Guidelines

Tree preservation is intended to not only foster tree survival during development, but also to promote maintenance of tree health and beauty into the future. Retained trees that are injured or damaged during construction or are insufficiently maintained afterward become a liability rather than an asset. How an individual tree responds to disturbances will depend on the extent of excavation and grading, the care with which demolition is undertaken, and the construction methods employed. Coordinating any construction activity inside the Tree Protection Zone (TPZ) can minimize these impacts.

The following recommendations may help to reduce impacts to trees from development and maintain and improve their health and vitality through the clearing, grading and construction phases.

Design Recommendations

1. Any changes to the plans involving the trees should be reviewed by the Consulting Arborist with regard to tree impacts. These include, but are not limited to: site plans, improvement plans, utility and drainage plans, grading plans, landscape and irrigation plans, and demolition plans.
2. **Tree Preservation Guidelines** prepared by the Consulting Arborist, which include specifications for tree protection prior to construction should be included on all plans.
3. Remove trees #523 – #528. Tree #529 retention status is to be determined during the preliminary excavation process by the Project Arborist.

Tree Protection Zone

1. **A TREE PROTECTION ZONE** shall be identified for each tree to be preserved on the Tree Protection Plan prepared by the Consulting Arborist. Fencing should be constructed to the trees dripline at minimum (unless otherwise stated) and any work conducted within any of the retained trees vicinity shall be monitored by the Project Arborist.

- a. Tree protection fences shall be installed to encompass the **TREE PROTECTION ZONE**. As detailed in this image below:

SCHEDULE "D" TREE PROTECTION BARRIER REQUIREMENTS

TRUNK DIAMETER X (cm)	STANDARD PROTECTION DISTANCE REQUIRED AROUND TREE-DISTANCE FROM TRUNK Y (m)
X	12X
20 cm	2.4 m
25 cm	3.0 m
30 cm	3.6 m
35 cm	4.2 m
40 cm	4.8 m
45 cm	5.4 m
50 cm	6.0 m
55 cm	6.6 m
60 cm	7.2 m
75 cm	9.0 m
90 cm	10.0 m
100 cm	12.0 m

NOTES:

- REFER TO DISTRICT OF CENTRAL SAANICH TREE MANAGEMENT BYLAW FOR STANDARD PROTECTION REQUIREMENTS.
- THE DIRECTOR MAY APPROVE AN ALTERNATIVE TO THE STANDARD PROTECTION DISTANCES WHERE AN ARBORIST CERTIFIES, TO THE DIRECTOR'S SATISFACTION, THAT A MODIFIED PROTECTION BARRIER WILL BE ADEQUATE TO PROTECT THE CRITICAL ROOT SYSTEM OF THE TREE SO THAT THE TREE REMAINS HEALTHY AND VIABLE.
- INSTALL TREE PROTECTION BARRIER BEFORE CONSTRUCTION BEGINS AND KEEP IN PLACE UNTIL LANDSCAPE CONSTRUCTION IS COMPLETE. DO NOT MOVE BARRIERS WITHOUT DISTRICT'S PRIOR APPROVAL AND ARBORIST SUPERVISION.

Tree Protection Fencing

NTS

- Fences must be installed after the trees are removed, but prior to the beginning of any excavation and must remain until the project is complete. See the illustration in Appendix I – Site Map for TPZ placement.
- No grading, excavation, construction or storage or dumping of materials shall occur within the **TREE PROTECTION ZONE** (TPZ). Any excavation, grading or digging within proximity to a retained tree's TPZ must be monitored at the time of work by the Project Arborist.
- No underground services including utilities, sub-drains, water or sewer shall be placed in the **TREE PROTECTION ZONE**.

Pre-demolition / Pre-construction Treatments and Recommendations

- The construction superintendents shall meet with the Project Arborist before beginning work to review all work procedures, access routes, storage areas, and tree protection measures.
- Fence all trees to completely enclose the Tree Protection Zone prior to any machine use, grubbing or grading. Fences are to remain until all grading and construction is completed.

3. Retrenchment prune tree #529 to remove large deadwood and reduce the overextended limbs overhanging the project area. Any tree pruning needed for clearance for construction must be performed by an ISA Certified Arborist and not by construction personnel.

Recommendations for Tree Protection during Construction

1. All contractors shall conduct operations in a manner that will prevent damage to trees to be preserved.
2. Tree protection devices are to remain until all site work has been completed within the work area. Fences or other protection devices may not be relocated or removed without permission of the Project Arborist.
3. Construction trailers, traffic and storage areas must remain outside **TREE PROTECTION ZONE** at all times.
4. The Project Arborist will be required to be on site to supervise the preliminary excavation. This will use an airspade and stump grinder and is to help to minimize the impacts to the retained trees. The Project Arborist must monitor the project during the sanitary line installation.
5. Any root pruning required, shall receive the prior approval of and be performed by the Project Arborist. Roots should be cut with a saw to provide a flat and smooth cut. Removal of roots larger than 5 cm in diameter should be avoided. Only the Project Arborist may prune the any of the trees roots. A report of the process will be written by the Project Arborist after the root pruning and then forward to the District of Central Saanich.
6. If injury should occur to any tree during construction, it should be evaluated as soon as possible by the Project Arborist so that appropriate treatments can be applied.
7. No excess soil, chemicals, debris, equipment or other materials shall be dumped or stored within the **TREE PROTECTION ZONE**.
8. Any tree pruning needed for clearance during construction must be performed by an ISA Certified Arborist and not by construction personnel.

Maintenance of Impacted Trees

Preserved trees will experience a physical environment different from that of the pre-development conditions. As a result, tree health and structural stability should be monitored. Occasional pruning, fertilization, mulch, pest management, replanting and irrigation may be required. In addition, provisions for monitoring both tree health and structural stability following construction must be made a priority. Inspect trees annually and following major storms to identify conditions requiring treatment to manage risk associated with tree failure.

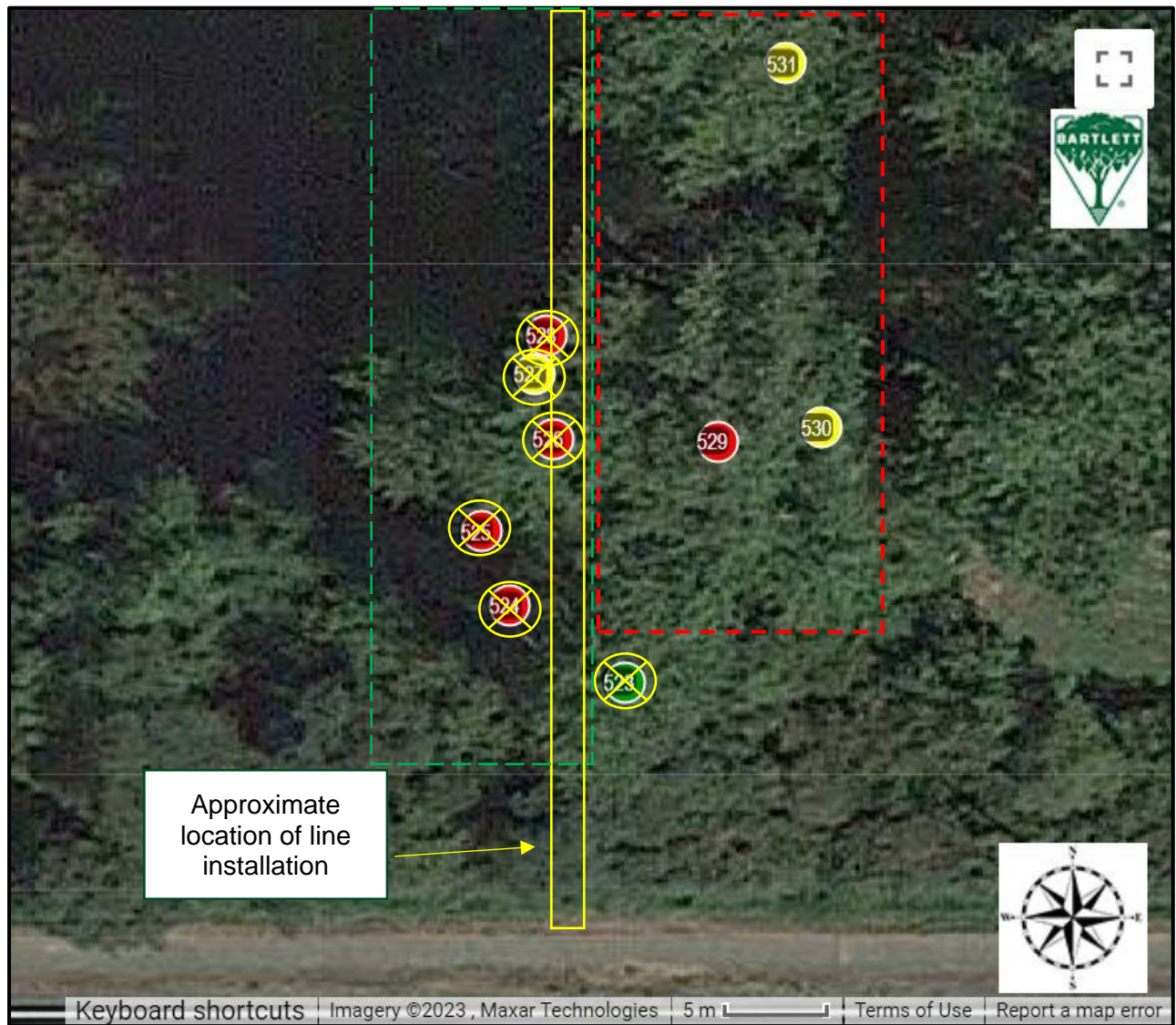
Our procedures included assessing trees for observable defects in structure. This is not to say that trees without significant defects will not fail. Failure of apparently defect-free trees does occur,

especially during storm events. Wind forces, for example, can exceed the strength of defect-free wood causing branches and trunks to break. Wind forces coupled with rain can saturate soils, reducing their ability to hold roots, and blow over defect-free trees. Although we cannot predict all failures, identifying those trees with observable defects is a critical component of enhancing public safety.

Furthermore, trees change over time. Our inspections represent the condition of the tree at the time of inspection. As trees age, the likelihood of failure of branches or entire trees increases. Annual tree inspections are recommended to identify changes to tree health and structure. In addition, trees should be inspected after storms of unusual severity to evaluate damage and structural changes. Initiating these inspections is the responsibility of the client and/or tree owner.

If you have any questions about my observations or recommendations, please contact me: Peter McAra at pmcara@bartlett.com

Appendix I – Site Map

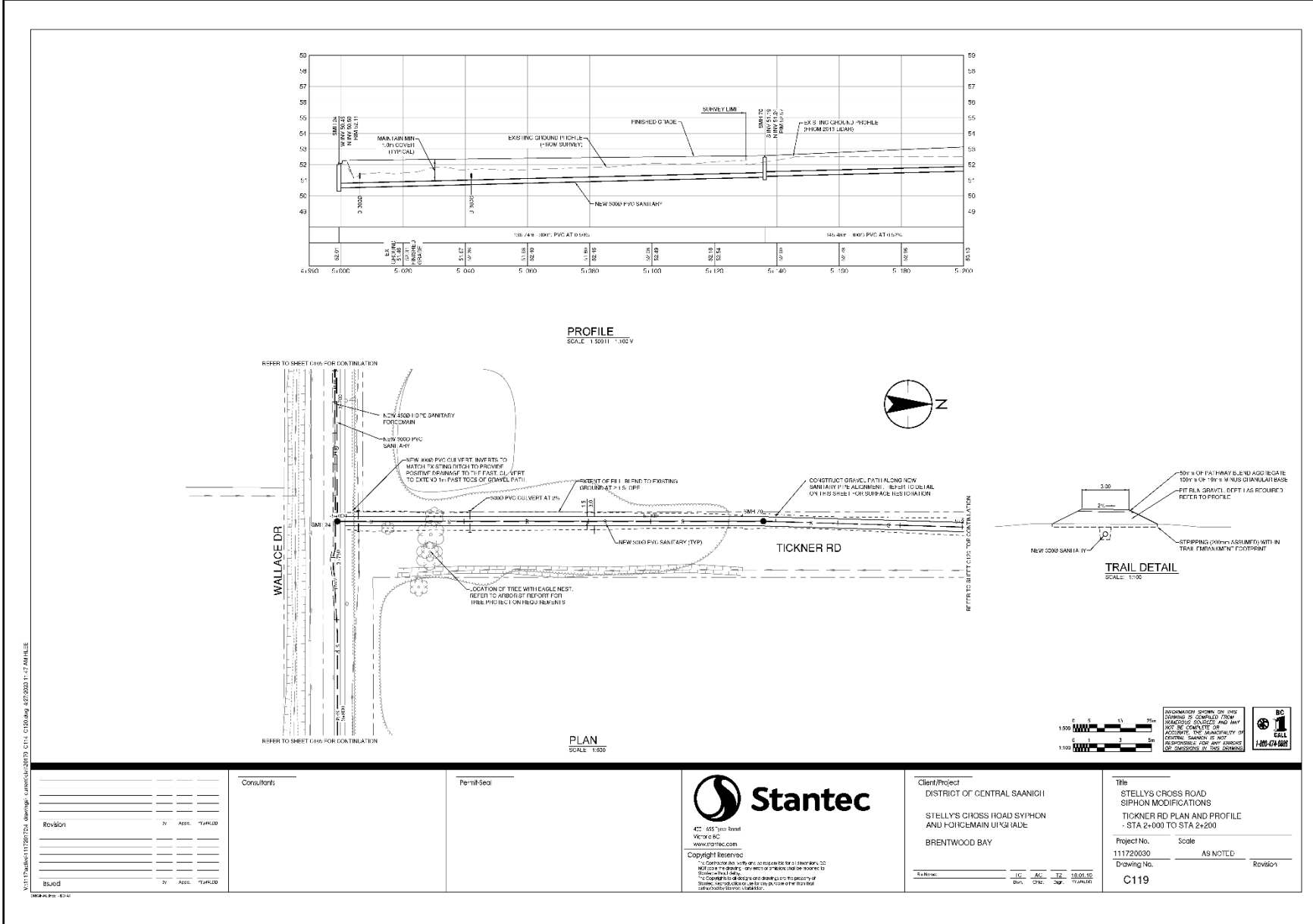


Legend

- Tree Protection Fencing
- Arborist Supervision Area
- Tree to be removed

***Fencing shown is an approximation**

Appendix II – Proposed Site Plan



M:\117\Drawings\117200\23\Drawings\Sanitary\117200_010.dwg 4/27/2023 11:47 AM HALE

Revision	BY	DATE	DESCRIPTION

Consultants: _____

Permit/Seal: _____

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Client/Project
DISTRICT OF CENTRAL SAANICH
STELLYS CROSS ROAD
AND FORCE MAIN UPGRADE
BRENTWOOD BAY

Title
STELLYS CROSS ROAD
SIPHON MODIFICATIONS
TICKNER RD PLAN AND PROFILE
- STA 2+000 TO STA 2+200

Project No. 111720030 Scale AS NOTED
Drawing No. C119 Revision

Appendix III – Tree Inventory Table

Tree ID	Species	DBH ¹ (cm)	Crown Radius (m)	Structural Condition	Health Condition	CRZ ² (m)	Protection Status	Relative Construction Tolerance	Suitability for Preservation ³	Recommendations
523	Balsam poplar (<i>Populus balsamifera</i>)	60	10.0	Good	Fair	-	Protected	Moderate - good	Low	Remove
524	Crabapple (<i>Malus fusca</i>)	29, 19	3.0	Poor	Fair	-	Protected	Moderate	Low	Remove
525	Babylon willow (<i>Salix babylonica</i>)	28, 23	4.0	Poor	Fair	-	Protected	Moderate - good	Low	Remove
526	Balsam poplar (<i>Populus balsamifera</i>)	12, 11	2.5	Poor	Poor	-	Unprotected	Moderate - good	Low	Remove
527	Balsam poplar (<i>Populus balsamifera</i>)	88	15.0	Fair	Fair	-	Protected	Moderate - good	Low	Remove
528	Crabapple (<i>Malus fusca</i>)	28, 23	2.0	Poor	Poor	-	Protected	Moderate	Low	Remove
529	Balsam poplar (<i>Populus balsamifera</i>)	*112	15.0	Poor	Fair	16.8	Protected	Moderate - good	TBD	TBD – Project Arborist to decide if tree can be retained following preliminary trench excavation.
530	Balsam poplar (<i>Populus balsamifera</i>)	*180	15.0	Fair	Fair	27.0	Protected	Moderate - good	Moderate	Retain and Protect. Tree has Eagle nest in upper canopy.
531	Balsam poplar (<i>Populus balsamifera</i>)	*108	15.0	Fair	Fair	13.0	Protected	Moderate - good	Moderate	Retain and Protect.

¹ DBH- Diameter at Breast Height measured at 1.4m above ground. *Estimated DBH

² CRZ - critical root zone, radial distance from the centre of the stem, measurements are based on the *Best Management Practices* and *ANSI A300 Part 5* standards for managing trees during constructions, calculated at 6 to 18 times the DBH relative to species tolerance to construction and maturity.

³ Suitability for Preservation- based on the species tolerance to construction, overall condition of the specimen, and location

Species Tolerance to Construction Damage	Relative Maturity	CRZ Multiplication Factor
High / Good	Young	6
	Mature	8
	Over Mature	12
Medium/ Moderate	Young	8
	Mature	12
	Over Mature	15
Low / Poor	Young	12
	Mature	15
	Over Mature	18

Guidelines for determining tree protection zone radius for healthy, structurally sound trees (adapted from Matheny and Clark, 1998, and the British Standards Institute).

Appendix IV - Assumptions and Limiting Conditions

Any legal description provided to the consultant is assumed to be correct. Any titles and ownership to any property are assumed to be good and marketable. No responsibility is assumed for matters legal in character. Any and all property is evaluated as though free and clear, under responsible ownership and competent management.

Care has been taken to obtain all information from reliable sources. All data has been verified insofar as possible; however, the consultant can neither guarantee nor be responsible for the accuracy of information provided by others.

The consultant shall not be required to give testimony or attend court by reason of this report unless subsequent contractual arrangements are made, including payment of an additional fee for such services as described in the fee schedule and contract of engagement.

Loss or alteration of any part of this report invalidates the entire report.

Possession of this report or a copy thereof does not imply right of publication or use for any purpose by any other than the persons to whom it is addressed, without the prior expressed written or verbal consent of the consultant.

This report, or any copy thereof, shall not be conveyed, in whole or in part, by anyone, including the client, to the public via any media type or outlet, without the prior expressed consent of the consultant specifically as to value conclusions, identity of the consultant, or any reference to any professional society or institute or to any initialed designation conferred upon the consultant as stated in his qualification.

This report and values expressed herein represent the opinion of the consultant, and the consultant's fee is in no way contingent upon the reporting of a specified value, a stipulated result, the occurrence of a subsequent event, nor upon any finding to be reported.

Illustrations, diagrams, graphs, and photographs in this report, being intended as visual aids, are not necessarily to scale and should not be construed as engineering or architectural reports or surveys.

Information contained in this report covers only those items that were examined and reflects the condition of those items at the time of inspection. There is no warranty or guarantee, expressed or implied, that problems or deficiencies of the plans or property in question may not arise in the future.

Appendix V - Certificate of Performance

I, Peter McAra, certify that:

I have no current or prospective interest in the trees on the property, and have no personal interest or bias with respect to the parties involved;

The analysis, opinions and conclusions stated herein are my own and are based on current scientific procedures and facts;

My analysis, opinions, and conclusions were developed and this report has been prepared according to commonly accepted arboricultural practices;

No one provided significant professional assistance to me, except as indicated within this report;

My compensation is not contingent upon the reporting of a predetermined conclusion that factors the cause of the client or any other party, nor upon the results of the assessment, the attainment of stipulated results, or the occurrence of any subsequent events.

I further certify that I am an International Society of Arboriculture (ISA) Certified Arborist #PN-7521A and am tree risk assessment qualified. I am a member in good standing of the ISA. I have been involved in the field of Arboriculture in a fulltime capacity for a period of 17 years.

Signed: *Peter McAra*

Date: May 2, 2023